

REMARKS

The Examiner has indicated in the outstanding Office Action, Paper No. 7, dated April 8, 2002, that the specification, including the claims, has holes punched on essentially every page and that the holes have obscured and/or removed words from the first and/or second lines of every page.

The Examiner has also identified in the outstanding Office Action that claims 7 and 8 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph.

The Examiner has expressed concern regarding claims 1-16, asserting that under 35 U.S.C. § 112, first paragraph, the identified claims are indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Furthermore, the Examiner has alleged that claims 1, 3, 5, and 14 are anticipated by the patent reference Imparato et al. (U.S. Patent No. 4,327,237). The Examiner has also expressed obviousness concerns regarding claims 1-6 and 9-16. Particularly, the Examiner has indicated that claims 4, 15 and 16 are allegedly unpatentable over the Imparato et al. patent reference. The Examiner further indicates that claims 1-6, 9, 10, and 14-16 are allegedly unpatentable over Scott (U.S. Patent No. 3,700,615) in view of Vanlautem et al. (U.S. Patent No. 4,145,526). The Examiner has also indicated that claims 11-13 are allegedly upatentable over Scott in view of Vanlautem et al. as applied to claim 1, and further in view of Coenen et al. (U.S. Patent No.4,642,401).

The present amendment and request for reconsideration is provided with the intent of being fully responsive to the outstanding Office Action and responsive to each ground of objection and rejection presented by the Examiner. Accordingly, this present response is a bona fide attempt to advance the application to allowance and issuance pursuant to 37 C.F.R. § 1.111.

Specification Objection by the Examiner under 37 C.F.R. § 1.125(a)

The application has been reviewed to determine the locations of the “hole punching” in the application. The hole locations in the application cannot be presently determined based upon the filed application papers, as it is undetermined if the punched holes were present in the pages of the application as filed or were later generated by the Patent Office after filing. In any event, the specification, including the claims, as filed and as amended prior to this present Amendment and Request for Reconsideration has been provided as required by the Examiner to improve the clarity of the written description and claims and to incorporate previous amendments without introducing new matter.

The amendments to the specification are likely to be sufficiently numerous such that these amendments have been incorporated for the Examiner’s convenience and at the Examiner’s insistence in the attached substitute specification rather than being implemented in a paragraph-by-paragraph or claim-by-claim amendment format to the application. It is believed that the number of amendments to the written description would have made understanding the amended specification unnecessarily difficult. Instead, a “substitute specification” format has been used with the substitute specification, including claims, being submitted in a “clean copy” form. It should be noted, however, that this present Amendment and Request for Reconsideration provides additional amendments to the claims that should be subsequently entered after entry of the substitute specification.

In light of the requirement made by the Examiner in Paper No. 7, the substitute specification is directly comparable to the original specification without holes, except for all previous amendments now of record. The previous amendments of record and the full text of the specification unbroken by punched holes are not understood to constitute new matter. Accordingly, and pursuant to the Examiner’s instructions in Paper No. 7, a marked copy of the substitute specification showing the previous amendments and the location of the punched holes has not been provided in this response. Should the Examiner have need for a marked copy of the specification, the Examiner is requested to contact the undersigned to facilitate provision of a

marked copy to the Patent Office. The Examiner's approval and entry of the substitute specification, including claims, in accordance with 37 C.F.R. § 1.125(a) is respectfully requested.

Claims Allowed and Objected to by the Examiner

The Examiner has indicated that claims 7 and 8 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Applicant appreciates the Examiner's indication of allowable claims. Claims 7 and 8 may be pursued in independent claim form, potentially as suggested by the Examiner, at a later point in prosecution or in subsequent applications including continuing applications, without prejudice or disclaimer to the claims as originally presented or as subsequently presented or modified.

35 U.S.C. § 112, Second Paragraph Concerns

The Examiner has indicated that claims 1-16 may not particularly point out and distinctly claim the subject matter of the invention in accordance with statutory requirements. The statute provides, as the Examiner is likely well aware, that the specification shall conclude with claims "particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." 35 U.S.C. § 112, second paragraph. Claims 1, 2, and 5-7 have been amended to address issues of clarity.

Regarding claims 9 and 10, it is presently asserted that the step of "sensing the relative amount of free radicals likely to be present in said solution after it is heated" is itself sufficient to define the claimed step to sense the relative amount of free radicals. Claim 10, for example, recites one process step of one embodiment of the present invention that further defines the limitation of claim 9. Other embodiments may be disclosed in the specification. Further, some embodiments of "sensing" may be known to one of skill in the art as required by the statute. Therefore, it is presently asserted that the claimed step of claim 9, "sensing the relative amount of free radicals likely to be present in said solution after it is heated", is clearly and adequately

defined to provide the boundaries of the claim as a statutorily and judicially accepted claim element.

Regarding claims 11-13, it is presently asserted that the steps of “recycling”, as recited in claims 11 and 12, are sufficient to clearly define a claimed process step. It is not intended to limit the claim to a “point” or a location as the Examiner suggests. Therefore, it is presently asserted that the claimed steps of claims 11 and 12, “recycling”, are clearly and adequately defined to provide the boundaries of the claim as a statutorily and judicially accepted claim element.

Regarding claims 15 and 16, it is presently asserted that the expressions “heavy oil” and “low value oil” are sufficient to clearly define a process claim element or step. The term heavy oil and low value oil, for example, are clearly defined at page 5, lines 2 and 3 of the originally filed application.

Accordingly, it is urged that the present claims clearly point out and distinctly claim the subject matter which the applicant regards as his invention. If the Examiner’s maintains a concern after this response regarding the clarity of the claims, the Applicant requests that the Examiner contact the attorney of record via telephone to expeditiously resolve such concerns.

Novelty Concerns

The Examiner has indicated that claims 1, 3, 5, and 14 are allegedly anticipated by the *Imparato et al.* reference.

As the Examiner is well aware, a prima facie case of anticipation must be made by the examiner in a rejection of claims based upon 35 U.S.C. § 102. Particularly, “a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single art reference.” Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631 (Fed. Cir. 1987). Furthermore, “the identical invention must be shown in as

complete detail as is contained in the . . . claim.□ Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989); see, also, MPEP 2131. To establish anticipation from a cited reference, the reference must teach every element of the claim. See MPEP § 2131. In particular regard to process claims, anticipation requires identity of the claimed process and a process of the prior art; the claimed process, including each step thereof, must have been described or embodied, either expressly or inherently, in a single reference. Glaverbel S.A. v. Northlake Mkt'g & Supp., Inc., 45 F.3d 1550, 33 USPQ2d 1496 (Fed. Cir. 1995). It is urged that the cited Imparato et al. reference does not teach, expressly or inherently, the limitations of independent claim 1, and that the complete detail of the invention is not shown as claimed. Further, it is urged that the claimed process does not read on the disclosure of Imparato et al. and that the process of Imparato et al. is not the process of independent claim 1.

Claim 1 is a process for decomposing waste plastic. The process provides, for example, the steps of supplying waste plastic, a step of heating the solution to a reactant temperature to substantially depolymerize the waste plastic, and a step of collecting the by products of the depolymerization process. Further, the claim 1 provides for the waste plastic to be mixed with a diluent to create a solution. The process itself, that of decomposing waste plastic, and the steps thereof, are not disclosed in the Imparato et al. reference. The Imparato et al. reference may disclose a process for preparing viscosity index improvers for lubricating oils. The reference may provide such process by cracking synthetic rubbers, potentially in the liquid phase. This process is not a process for decomposing waste plastic. Particularly, identity of the claimed process in claim 1 and the process of Imparato et al. has not been established. Although the Examiner asserts that the reference discloses a process of decomposing plastic, this process appears to disclose a process for preparing lubricating oils with improved viscosity index. See, for example, Column 1, lines 6-18 and lines 39-50; see Examples 1-7 of Columns 3 and 4. Therefore, it does not appear that the identical invention is shown as recited in independent claim 1, and the identity of the claimed process and the process of the prior art has not been established as having been described or embodied, either expressly or inherently, in the single reference of Imparato et al.

Further, each and every element as set forth in claim 1 does not appear to be found, either expressly or inherently described, in Imparato et al., and the Examiner has not identified every element, particularly in as complete detail as is contained in the claim. For example, the embodiment of the invention recited in claim 1 provides the step of collecting the by products of the depolymerization process. Such step has not been identified in the process of the cited art. Further, other steps of claim 1 are not disclosed in Imparato et al., such as those steps involving the decomposition of waste plastic, supplying waste plastic, mixing waste plastic, and the heating steps. Other steps of claim 1 do not appear to be disclosed in the cited reference. This may not be surprising, for example, as the process of Imparato et al. does not appear to be directed to the handling of waste plastic, or to the other claimed features of claim 1.

Therefore, it is requested that the Examiner withdraw the novelty concerns directed to the Imparato et al. reference and with regard to independent claim 1, and the corresponding dependent claims 3, 5, and 14 as incorporating the limitations of the independent claim. If a prima facie case of anticipation cannot be made based upon Imparato et al., the Examiner is earnestly requested to withdraw such novelty concerns.

Obviousness Concerns

The Examiner has indicated that claims 4, 15, and 16 are allegedly unpatentable over Imparato et al. The Examiner has also indicated that claims 1-6, 9, 10, and 14-16 are allegedly unpatentable over Scott in view of Vanlautem et al. The Examiner has further indicated that claims 11-13 are allegedly unpatentable over the Scott in view of Vanlautem et al., further in view of Coenen et al.

As the Examiner is aware, the burden of the Examiner in establishing a prima facie case of obviousness includes establishing that all claim limitations are taught or suggested by the prior art. In re Royka, 490 F.2d 981 (C.C.P.A. 1974). It is urged that the cited references do not teach or disclose the invention as claimed in independent claims 1 and 2 or the associated dependent claims. Further, there must be some suggestion or motivation, either in references themselves or

in the knowledge generally available to one of ordinary skill in the art, to modify or combine the teachings of the references. Additionally, there must be a reasonable expectation of success. See MPEP 2142 (and the cases cited therein).

The Imparato et al. Reference

Independent claim 1 defines a process for decomposing waste plastic and claim recitations directed to such process, as previously described. Further, and as previously discussed, the claimed process is neither taught or suggested in the Imparato et al. reference. The claimed process in claim 1, for example, is that of decomposing waste plastic, and the steps thereof, such process not being disclosed in the Imparato et al. reference. The Imparato et al. reference may disclose a process for preparing viscosity index improvers for lubricating oils. The reference may provide such process by cracking synthetic rubbers, potentially in the liquid phase. This process is not a process for decomposing waste plastic or that of recycling waste plastic. Further, each and every element as set forth in claim 1 does not appear to be taught or suggested, either expressly or inherently, in Imparato et al., and the Examiner has not identified every element as being taught or suggested so as to read on claim 1. For example, the embodiment of the invention recited in claim 1 provides the step of collecting the by products of the depolymerization process. Such step is not taught or suggested in the process of the cited art. The cited reference, for example, appears to be directed to modifying the viscosities of lubricating oils, and does not appear to teach or suggested collecting by products of a depolymerization process.

Further, other steps of claim 1 are not taught or suggested in Imparato et al., such as those steps involving the decomposition of waste plastic, supplying waste plastic, mixing waste plastic, and the heating steps. Other steps of claim 1 do not appear to be disclosed in the cited reference. Again, this may not be surprising, for example, as the process of Imparato et al. does not appear to be directed to the handling of waste plastic, or to the other claimed features of claim 1. In regard to the dependent claims 4, 15, and 16, these claims incorporate the claim elements or

steps and the limitations thereof and further define over the cited Imparato et al. reference as present argued.

The examiner has not identified disclosure in the Imparato et al. reference that would teach or suggest all of the claim limitations of claim 1 and has not relied upon a secondary reference to satisfy such deficiencies in the prima facie case. As the examiner may be aware, the examiner has the burden of factually supporting any prima facie conclusion of obviousness. See MPEP § 2142. It is presently urged that the Examiner has not provided a prima facie conclusion of obviousness based upon the Imparato et al. reference. If a prima facie case of anticipation cannot be made based upon Imparato et al., the Examiner is earnestly requested to withdraw such novelty concerns.

The Scott and Vanlaudem et al. References

In regard to claims 1-6, 9, 10, and 14-16, the Scott reference appears to disclose a process for waste rubber disposal. The Scott reference does not appear to be directed, teach, or suggest the depolymerization achieved according to the present invention. The present invention provides depolymerization reactions known to “unzip” synthetic polymer structures and to break the structure into smaller molecules, as described, for example, at page 4, lines 5-14. Such depolymerization does not appear to be taught or suggested by the prior art. The Scott reference appears to primarily disclose the devulcanization of rubber. Rubber compounds may be considered polymeric chains weakly held together by sulfur bonds, the sulfur bonds. It is most interesting to note that, as defined in Scott, the terms “depolymerize”, depolymerizing”, and depolymerization” are used with reference to devulcanization and are not intended to mean that the rubber is in each case completely depolymerized into the one or more monomers from which it was produced. Column 5, lines 60-79.

As the process of Scott does not appear to be directed to the depolymerization of the present invention, there does not appear to be suggestion to combine this reference with the teaching of Vanlaudem et al. Particularly, the combination of Scott with other references

potentially teaching depolymerization techniques would appear to change the principal of operation of the Scott reference. Further, steps claimed in claims 1 and 2, such as collecting the by products of said depolymerization process or recovering hydrocarbon distillate as an overhead product and condensing and storing said distillate, are not only apparently not taught or suggested in the cited references, but do not suggest or motivate to combine the references, for example, when Scott appears to have a fundamentally different principal of operation and process.

Again, the present invention is direct to breaking the structure into smaller molecules. In some embodiments, the process forms distillates that may be needed for the Scott process. Therefore, again, the principal of operation of the Scott reference may fundamentally change the principals of the disclosed process when combined with other references such as Vanlaudem et al. Thus, while the Scott reference may disclose a useful process for devulcanizing rubber, it does not disclose the processes claimed in claims 1 and 2.

It is urged, therefore, that the cited references do not disclose or suggest the invention as claimed in independent claims 1 and 2 and that claims 1 and 2 are nonobvious as to the applied references. As the Examiner is also likely aware, if an independent claim is nonobvious under 35 U.S.C. § 103, claims depending from the independent claim are also nonobvious. In re Fine, 837 F.2d 1071 (Fed. Cir. 1988). It is urged, therefore, that the dependent claims are nonobvious as to the applied references as dependent from independent claims 1 and 2, and that all of the claims, for at least the reasons provided above, are nonobvious over the additionally cited references.

It is presently urged that the Examiner has not provided a prima facie conclusion of obviousness based upon the cited references, and that the applicant has provided sufficient showing to support a nonobviousness determination based upon the art cited. Further, if a prima facie case of obviousness cannot be made based upon the art cited, the Examiner is earnestly requested to withdraw such novelty concerns.

Amendments to the Written Description and Claims and Insertion of Claims

Claims 23-33 have been provided to provide consistency to claim recitations and to further claim particular features of the present invention in dependent form. Claims 23-33 are believed to be adequately disclosed in the application and are not understood to constitute new matter. Further, claims 23-33, dependent from claims 1 and 2, are believed to be patentable, at least for the reasons previously described and in light of the applied references.

Statement Regarding Amendments and Embodiments of the Present Invention

Amendments to the present application, in particular amendments to the claims, and remarks in the prosecution of the application have been provided with the understanding that the present and originally presented claims, including any embodiments of the present invention disclosed, may be later presented in continuing applications, without prejudice or disclaimer. The amendments and remarks have been particularly presented to avoid, where applicable, any admission or estoppel, generally, negatively affecting the scope of protection provided by the disclosure and claims of the present application, and particularly to avoid prosecution history estoppel, limitation of the scope of equivalences, or the like, particularly for any insubstantial substitute or any unforeseeable equivalent at the time of the application.

Conclusion

Claims 1-16 remain in the application and claims 23-33 have been introduced. The Applicant respectfully and earnestly requests early reconsideration of the application and allowance of the present claims.

Dated this 8th day of October, 2002.

Respectfully submitted,

SANTANGELO LAW OFFICES, P.C.

By: _____



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

The specification has been replaced by the attached substitute specification.

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Please cancel the priority statement at page one line 1 and insert the following priority statement:

This application claims priority, as a divisional application, from the parent U.S. application 08/525,639, filed September 6, 1995, which is a national phase application of PCT/US94/02433 filed March 8, 1994, which is a PCT application of US nonprovisional application number 08/028,844 filed March 10, 1993, now abandoned.

In the claims:

Claims 1, 2, and 5-10 have been amended as follows:

1. (Amended) A process for decomposing waste plastic comprising the steps of:
 - a. supplying waste plastic;
 - b. mixing said waste plastic with a diluent to create a solution;
 - c. controlling the content of said solution [to assure that it will contain a sufficient free radical content when heated]; [then]
 - d. heating said solution to a reactant temperature to substantially depolymerize the waste plastic; and
 - e. collecting the by products of said depolymerization process.
2. (Amended) A process for the recycling of waste plastic comprising:
 - a. mixing said waste plastic with oil to form a mixture [, selected from comminuted waste plastic comprising polyethylene, polypropylene, polystyrene, polyethylene

terephthalate, polyvinyl chloride, other waste plastic, and combinations thereof, with oil, selected from waste motor oil, fluidized catalytic cracker slurry oil, distillation tower vacuum bottoms, and heavy heating or bunker oil, and combinations thereof, and free radical catalyst precursor];

- b. heating said mixture in the presence of about 0.5% to 10% wt of a free radical initiator to between about 325 and 375°C for a period less than about one hour[:];
and
- c. [meeting process energy requirements by recycling back burnable products]
recovering hydrocarbon distillate as an overhead product and condensing and storing said distillate.

- 5. (Amended) A process for decomposing waste plastic as described in claim 1, wherein said step of controlling the content of said solution [to assure that it will contain a sufficient free radical content when heated] comprises the step of adding [an additional] a third substance to said process respective of said waste plastic and said oil.
- 6. (Amended) A process for decomposing waste plastic as described in claim 1 wherein said step of controlling the content of said solution [to assure that it will contain a sufficient free radical content when heated] comprises the step of [assuring an appropriate amount of free radical precursor is present in said process] controlling free radical precursor of said solution.
- 7. (Amended) A process for decomposing waste plastic as described in claim 6 wherein said step of [assuring an appropriate amount of free radical precursor is present in said process] controlling free radical precursor of said solution comprises the step of adding a [particular] waste plastic material to said process.
- 8. (Amended) A process for decomposing waste plastic as described in claim 6 wherein said step of [assuring an appropriate amount of free radical precursor is present in said process]

controlling free radical precursor of said solution comprises the step of adding a substance chosen from a group consisting of polyvinyl chloride and polyurethane.

9. (Amended) A process for decomposing waste plastic as described in claim 1 wherein said step of controlling the content of said solution [to assure that it will contain a sufficient free radical content when heated] comprises the step of sensing the relative amount of free radicals likely to be present in said solution after it is heated.
10. (Amended) A process for decomposing waste plastic as described in claim 9 wherein said step of sensing the relative amount of free radicals likely to be present in said solution after it is heated comprises the step of ascertaining the reactant temperature of [the] said solution.

Claims 23-33 have been inserted as follows:

23. A process for decomposing waste plastic as described in claim 1, wherein said step of controlling the content of said solution comprises controlling the free radical content of said solution.
24. A process for decomposing waste plastic as described in claim 1, wherein said step of controlling the free radical content comprises controlling the free radical content to substantially depolymerize said waste plastic.
25. A process for the recycling of waste plastic as described in claim 2, wherein said waste plastic comprises comminuted waste plastic selected from the group consisting of: polyethylene, polypropylene, polystyrene, nylon-66, polyurethane, polyethylene terephthalate, polyvinyl chloride resin, and combinations thereof.
26. A process for the recycling of waste plastic as described in claims 25, wherein said oil comprises oil selected from the group consisting of: waste motor oil, FCC slurry oil,

vacuum distillation tower bottoms, fluidized catalytic cracker slurry oil, heavy heating oil, bunker oil, and combinations thereof.

27. A process for the recycling of waste plastic as described in claim 1 wherein the free radical initiator comprises a separate catalyst precursor added to said waste plastic and/or said oil.
28. A process for the recycling of waste plastic as described in claim 1 wherein said waste plastic includes polyvinyl chloride and no separate free radical catalyst precursor is employed.
29. A process for the recycling of waste plastic as described in claim 26 wherein said waste plastic dissolves in said oil.
30. A process for the recycling of waste plastic as described in claim 26 wherein the distillate comprises a distillate selected from the group consisting of toluene, styrene, and combinations thereof.
31. A process for the recycling of waste plastic as described in claim 26 wherein additional free radical initiator is introduced in response to a decrease in distillate yield or increase in temperature.
32. A process for the recycling of waste plastic as described in claim 26 wherein said overhead further comprises non-condensable gas and normally-solid speciality substances.
33. A process for the recycling of waste plastic as described in claims 29-32, wherein oil containing dissolved waste plastic is recycled to a reactor.